

WHAT IS CLAIMED IS:

1. A pump for dispensing fluid, comprising:
  - a multistage pump having a feed chamber and a dispensation chamber therein connected through a series of valves and motors configured to draw fluid within the respective chambers and to dispense the fluid from the pump;
  - a fluid reservoir for providing fluid to the feed chamber; and
  - a pump controller for controlling the operation of the series of valves and motors in the pump so that fluid is passed between the feed chamber and the dispensation chamber and dispensed wherein a precise amount of fluid is dispensed without a double dispense or a sputtered dispense.
2. The pump of Claim 1, wherein the multistage pump further comprises
  - a barrier valve disposed in the feed chamber being controlled by the pump controller so that the barrier valve is closed so that an increased pressure results within the dispensation chamber;
  - a dispensation motor disposed in the dispensation chamber configured to operate in a forward and a reverse direction being controlled by the pump controller so that the dispensation motor is operated in the reverse direction to compensate for the pressure in the dispensation chamber such that upon the dispensation motor being operated in the forward direction the pressure in the dispensation chamber results in a zero pressure; and
  - an outlet valve disposed in the dispensation chamber being controlled by the pump controller so that the outlet valve is opened so as to dispense the fluid from the dispensation chamber upon the dispensation motor being operated in the forward direction.
3. The pump of Claim 1, wherein the multistage pump comprises:
  - a fluid drawing means for drawing fluid from the fluid reservoir and supplying the fluid to the multistage pump;
  - a filtering means for filtering impurities from the fluid; and
  - a dispensing means for providing the filtered fluid to the object, wherein the filtering means is disposed between the drawing means and the dispensing means,

fluid is pressurized and so that the dispense diaphragm is moved between the second and first positions when the hydraulic fluid is depressurized.

10. A process for controlling a multistage pump to dispense a fluid, the multistage pump having a feed chamber, a dispensation chamber and a filter disposed therebetween, the process comprising:

a ready stage for bringing the feed chamber to an equilibrium pressure state, wherein upon opening an isolation valve disposed in the feed chamber, closing an outlet valve disposed in the dispensation chamber and opening a barrier valve disposed in the feed chamber, the feed chamber is brought to an equilibrium pressure state;

a dispense stage for dispensing the fluid onto an object, wherein a dispensation pump disposed in the dispensation chamber is activated to dispense the fluid onto an object upon closing the isolation valve and opening the outlet valve such that the dispensation pump is activated subsequent to the outlet valve being opened so as to eliminate stuttered dispensing of the fluid; and

a suckback stage for eliminating excess fluid that flows out of the dispensation chamber, wherein operation of the dispensation pump is reversed to suck excess fluid back into the dispensation chamber and wherein the outlet valve is closed after the excess fluid is sucked back into the dispensation chamber.

11. The process of Claim 10 further comprising a fill stage for drawing fluid into the feed chamber, wherein upon opening the inlet valve and applying a vacuum to the a feed diaphragm disposed within the feed chamber the fluid is drawn into the feed chamber.

12. The process of Claim 10, wherein excess fluid spitting is eliminated from the dispensation chamber.

13. A method for controlling the opening and closing of a plurality of valves and the activating and deactivating of a plurality of motors in a multistage pump having a feed chamber, a dispensation chamber and a filter disposed therebetween, the method comprising the steps of:

4. The pump of Claim 3, wherein the fluid drawing means comprises a feed diaphragm disposed within the feed chamber and configured to move between a first drawing position and a second purging position in accordance with a drawing force such that upon the feed diaphragm moving from the second purging position to the first drawing position, the fluid is drawn into the feed chamber via an inlet valve and upon the feed diaphragm moving from the first drawing position to the second purging position, the fluid is provided to the dispensation chamber via a feed valve.

5. The pump of Claim 4, wherein the drawing force is either a vacuum force, a positive feed pressure force or an atmospheric force.

6. The pump of Claim 4, further comprising a vent valve configured to remove air bubbles from the fluid.

7. The pump of Claim 3, wherein the filtering means comprises a filter for removing impurities from the fluid and a vent valve for removing air bubbles from the fluid or for relieving excess pressure from the multistage pump.

8. The pump of Claim 3, wherein the dispensing means comprises a dispense diaphragm disposed within the dispensation chamber and configured to move between a first drawing position and a second purging position in accordance with a drawing force such that upon the dispense diaphragm moving from the second purging position to the first drawing position, the fluid is drawn into the dispensation chamber via a feed valve and upon the dispense diaphragm moving from the first drawing position to the second purging position, the fluid is provided to the object via an outlet valve.

9. The pump of Claim 8, wherein the dispensing means further comprises a hydraulic fluid chamber configured to pressurize a hydraulic fluid resident within the hydraulic fluid chamber so that the dispense diaphragm is moved between the first and second positions when the hydraulic

closing a barrier valve in the feed chamber so as to increase the pressure within the dispensation chamber;

reversing the operation of a dispensation motor in the dispensation chamber so as to compensate for the pressure increase within the dispensation chamber;

further reversing the operation of the dispensation motor so that when the dispensation motor is forward activated to compensate for backlash, the pressure of the dispensation chamber remains at a zero pressure;

opening an outlet valve in the dispensation chamber; and

operating the dispensation motor subsequent to opening the outlet valve so that fluid is dispensed from the dispensation chamber.

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